

REMARKS

Claim 23 stands rejected under 35 U.S.C. 102(b) as being anticipated by International Application No. WO 96/12541 to Holmes et al. ("Holmes"). Claims 1-22 and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Holmes.

Claim 23 has been canceled. Applicants submit that Claims 1-22 and 24 are patentable over Holmes for the following reasons.

In the rejection of Claims 1-22 and 24 over Holmes, the Action states that the number of substrates bonded together, cutting techniques and channel configurations are within the purview of one having ordinary skill in the art and would have been obvious to employ as a matter of design choice based on desired physical characteristics of the article being manufactured. *See* the Action, pages 2-3. Applicants respectfully disagree. As required by § 103, the prior art must provide a motivation or suggestion for one of skill in the art, without the benefit of Applicants' specification, to make the modification. There is no such suggestion or motivation to modify Holmes. *See* M.P.E.P. § 2142.

Claim 1 recites forming at least one cut in an external face of a substrate, the cut being of sufficient depth to intersect one or more of the channels such that, in use, a fluid passing along a fluid pathway defined by the at least one cut may pass into the at least one channel. Claim 1 further recites that the substrates are bonded before the at least one cut is formed therein. Holmes does not teach or suggest at least this recitation.

In contrast, Holmes proposes assembly techniques in which the substrates are positioned together after the cuts or other features are formed therein. Specifically, Holmes discusses that the channels or flow paths are formed by the assembly or superposition of substrates in which the features defining passageways for fluids are etched. *See* Holmes, page 8, lines 16-21. Holmes states that "such rods, bores and threaded structures may bear such grooves, ridges or other structures as are required to allow an assembly of the subunits formation of channels with interfluid contact regions." Examples of the superposition of interfluid contact regions are shown, for example, in Figures 8a-8b and 9a-9b of Holmes. Holmes makes no mention of the bonding together

of substrates prior to the formation of a cut or cuts in the substrate.

Moreover, Holmes does not provide any suggestion or motivation for bonding the substrates prior to the formation of a cut and does not contemplate the advantages of the present invention. As discussed on page 2, line 30 to page 3, line 20 of the current application, the formation of channels and vias in micro-fluidic devices involves the removal of a volume of the substrate, and as a result, these channels and vias may not be self-supporting. Consequently, the formation of these channels and vias contributes to the fragility of the devices, and lowers yields during fabrication. In addition, the difficulty of etching high aspect ratio vias generally necessitates the use of techniques such as laser ablation or trench etching, which can be expensive and may not be widely available.

As discussed on page 10, lines 1-9 of the current application, bonding the substrates before the cut(s) are formed may result in a better utilization of space and higher packing density of channels, improved yield (because the channels formed in one substrate are supported by another substrate and the substrates are less likely to break during the bonding process), and improved strength of the assembled device. In addition, by cutting the substrates after the bonding of the substrates, problems which might be encountered with alignment of contactors and supply channels may be reduced.

In view of the foregoing, Applicants submit that it would not have been an obvious design choice to modify Holmes such that the substrates are cut after bonding the substrates together. Holmes proposes assembly techniques in which the substrates are positioned together after the cuts or other features are formed therein, and Holmes does not contemplate the performance advantages of cutting the substrates after bonding. Accordingly, Applicants request that the rejection be withdrawn.

Applicants respectfully submit that, for the reasons discussed above, the references cited in the present rejections do not disclose or suggest the present invention as claimed. Accordingly, Applicants respectfully request allowance of all

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the pending claims and passing this application to issue.

Respectfully submitted,

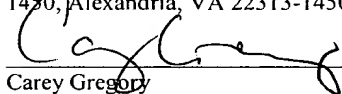


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